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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,462	04/21/2006	Osamu Hirose	IS-US040354	1067

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EXAMINER	
BITAR, NANCY	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
12/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,462	HIROSE, OSAMU	
	Examiner	Art Unit	
	NANCY BITAR	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/27/06; 8/14/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner Notes

1. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takayuki et al (JP 2004028891) in view of Takahashi et al (US 6,023,497).

As to claims 1 and 2 , Takayuki et al teaches creating an image processing procedure for an X-ray inspection apparatus which inspects an article by applying X-rays to the article, and processes an X-ray image created based on the detected X-rays transmitted through the article, the method comprising the steps of: providing a plurality of image processing procedures (X line

drawing image data generation process of carrying out image processing with two or more kinds of X line drawing image-processing filters F for emphasizing said foreign matter to said X-ray intensity data S of said excellent article V, and generating X line drawing image data Iv in said every X line drawing image-processing filter F, A filter extraction process of extracting optimal X line drawing image-processing filter F based on generated this X line drawing image data Iv. , paragraph [0009]; note that the X-ray intensity is used, and also the influence of an inspected thing is reduced by performing image processing which emphasizes a foreign matter using an image processing filter, and the signal of the foreign matter buried into the inspected thing is extracted, paragraph [0004]); processing the X-ray image through each of the image processing procedures, and calculating a degree of adaptability of each of the image processing procedures with respect to the X-ray image (figure 1); and automatically selecting an optimum image processing procedure to be used for inspection based on the degree of adaptability (automatically set the optimum X-ray image processing filter optimum for an examined substance in an inspected object, without depending on experience of an operator, paragraph[0010]). While Takahashi meets a number of the limitations of the claimed invention, as pointed out more fully above, Takahashi fails to specifically teach the calculation of a degree of adaptability of each of the image processing procedures with respect to the x-ray.

Specifically, Takayuki et al. teaches the contaminant-detecting apparatus based on these findings according to the present invention basically comprises a conveying means for conveying a product to be tested, an X-ray source means for radiating X-rays toward the product to be tested, an X-ray detection unit for detecting the X-rays transmitted through the product to be tested, a storage means for storing the two-dimensional distribution of the X-ray intensity

detected by the X-ray detection unit as a transmission image, and a processing means for processing the transmission image to determine the presence/absence of a mixed contaminant, wherein the processing means has an average calculating means for performing a sum-of-product operation for a kernel equal to or larger than 7.times.7 pixels around each pixel of the transmission image by using a predetermined coefficient matrix, thereby calculating a weighted average over the kernel, a difference calculating means for calculating the difference between the intensity of the given pixel and the weighted average over the kernel of this pixel, and a high-selectivity, high-sensitivity determining means for comparing the calculated difference with predetermined criteria, thereby determining the presence/absence of the contaminant. Moreover, Takayuki clearly teaches x-ray inspection apparatus that is highly selective toward contaminants, and performs a highly sensitive detection of contaminants wherein the X-ray inspection apparatus provides and combines a plurality of matrix sizes and coefficients for image processing in order to detect contaminants in various samples. It would have been obvious to one of ordinary skill in the art to calculating an adaptive degree for judging the optimum image processing procedure in Takahashi in order to conduct easily without operator invention an accurate inspection. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 3, Takahashi teaches an X-ray inspection apparatus according to claim 2, wherein the image acquisition unit actually detects X-rays that were applied to the article in order to newly acquire the X-ray image (paragraph [0014-0015]).

As to claim 4, Takahashi teaches an X-ray inspection apparatus according to claim 2, wherein the image acquisition unit retrieves and acquires the X-ray image from a memory unit that stores previously acquired X-ray images (paragraph [0023]; data memory 11; figure 1).

As to claim 8, Takahashi teaches the X-ray inspection apparatus according to claim 2, further comprising: a contaminant determination unit that inspects whether or not the article subject to inspection contains a contaminant, based on the X-ray image processed by the image processing procedure that was selected by the image processing procedure adoption determination unit (figure 7; note that this inspected thing W is judged to be those with a foreign matter (S26-No), and NG processing is carried out in the latter part (S28). On the other hand, when there is no X line drawing image data If of a foreign matter in the checking X line drawing image data Iwa, excellent article processing is carried out in (S26-Yes) and the latter part (S27)., paragraph [0047]).

As to claim 15, Takahashi teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit calculates the degree of adaptability at least based on the minimum and average brightness values of contaminants, and the maximum brightness value of areas excluding contaminants, in the resulting processed X-ray image (maximum brightness value Na (X line drawing image data Ie showing the edge of a box) of X line drawing image data Iva, The maximum brightness value Nb (X line drawing image data Ie showing the edge of a box) of X line drawing image data Ivb is compared with the maximum brightness value Nc (X line drawing image data Ie showing the edge of a box) of X line drawing image data Ivc. In this case, X line drawing image data Iva with the lowest maximum brightness value is extracted. And X line drawing image-processing filter Fa which

generated this extracted X line drawing image data Iva is extracted as optimal X line drawing image-processing filter F (S16); paragraph [0038-0041]; figures 4-5).

As to claim 5 and 6, Takayuki teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit randomly combines predetermined image processing components to create the plurality of image processing Procedures and the image processing components are filters for processing the X-ray image (when the coefficient of the coefficient matrix is 0, no calculation is performed, so that the number of times the sum-of-product operation is performed to calculate the average can be reduced., see abstract) .

As to claim 7, Takayuki teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit creates a plurality of new image processing procedures based on the degree of adaptability thereof, and repeats a routine for calculating the degree of adaptability in order to determine an image process procedure to adopt (figure 18, s3 to s11).

As to claims 9-13, Takayuki teaches the X-ray inspection apparatus according to claim 8, wherein the image acquisition unit acquires an image of a non-defective article subject to inspection, and blends the image of the non-defective article with an image of hypothetical contaminants of predetermined amount and size in order to create the X-ray image (X-ray inspection apparatus provides and combines a plurality of matrix sizes and coefficients for image processing in order to detect contaminants in various samples; figure 13).

As to claims 14, Takayuki teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit calculates the degree of adaptability of the image processing procedure in view of the processing time for each image processing procedure.

As to claim 16, Takayuki teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit creates a next-generation image processing procedure by blending two image processing procedures selected from the plurality of image processing procedures (processing an obtained X-ray transmission image, thereby detecting a small contaminant, e.g., metal, stone, glass, or the like, mixed in the product to be tested, in real time with high sensitivity; column 2, lines 56-column 3, lines 1-50)

As to claim 17, Takayuki teaches the X-ray inspection apparatus according to claim 2, wherein the image processing procedure adoption determination unit repeats the optimization of the image processing procedures until a predetermined number of generations is reached, a predetermined degree of adaptability is achieved, or a predetermined time period lapses (determination unit 9 for comparing the calculated difference with predetermined criteria to determine the presence/absence of the contaminant; figure 1; figures 12A-12B) .

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Nancy Bitar 12/10/2008